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ABSTRACT

The information needed by Congress and the U. S. Office of Education about vocational education and manpower training is discussed in terms of course information, student and trainee information, and professional personnel information. The data base consists of 38 nonaggregate data elements, and these are listed and described. The availability of the 38 data elements in local school districts and State agencies is discussed, and also the way a national data base using them can be implemented beginning with partial data now and partial automation. Complete automation with all data elements is described as it would operate when fully established at the local school district, State, and Federal levels. Suggested procedures for getting from where this kind of a national data base is now to where it would be described in full operation are detailed. Actual implementation is suggested in two stages, with specific procedures outlined for the first year, and the major activities noted for the second and subsequent years. The first year procedures are listed as the report's immediate recommendations. A glossary of nearly 150 technical and standardized terms used in the report is included at the end. (Author)

ED 099688

A DATA BASE
FOR
VOCATIONAL EDUCATION AND MANPOWER TRAINING

Project Baseline Supplemental Report

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For

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ABSTRACT

The information needed by Congress and the U.S. Office of Education about Vocational Education and manpower training is discussed in terms of course information, student and trainee information, and professional personnel information. In each case, the answers to most questions can be provided either by collecting the data required in aggregate form, or by collecting a limited number of data elements from the local school districts and training institutions in non-aggregate form. The data base being reported here consists of thirty-eight non-aggregate data elements, and these are listed and described.

The availability of the thirty-eight data elements in local school districts and State agencies is discussed, and also the way a national data base using them can be implemented beginning with partial data now and partial automation. Complete automation with all data elements is described as it would operate when fully established at the local school district, State, and Federal levels. Suggested procedures for getting from where this kind of a National data base is now to where it would be described in full operation are detailed.

Actual implementation is suggested in two stages, with specific procedures outlined for the first year, and the major activities noted for the second and subsequent years. The first year procedures are listed as the report's immediate recommendations. A glossary of nearly 150 technical and standardized terms used in the report is included at the end.

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INTRODUCTION

Project Baseline is a National study of Vocational Education and manpower training. During the first year of the study, members of the staff became convinced that a National automated data base should be explored. During the second year, this was done, and the following report contains the results of that investigation.

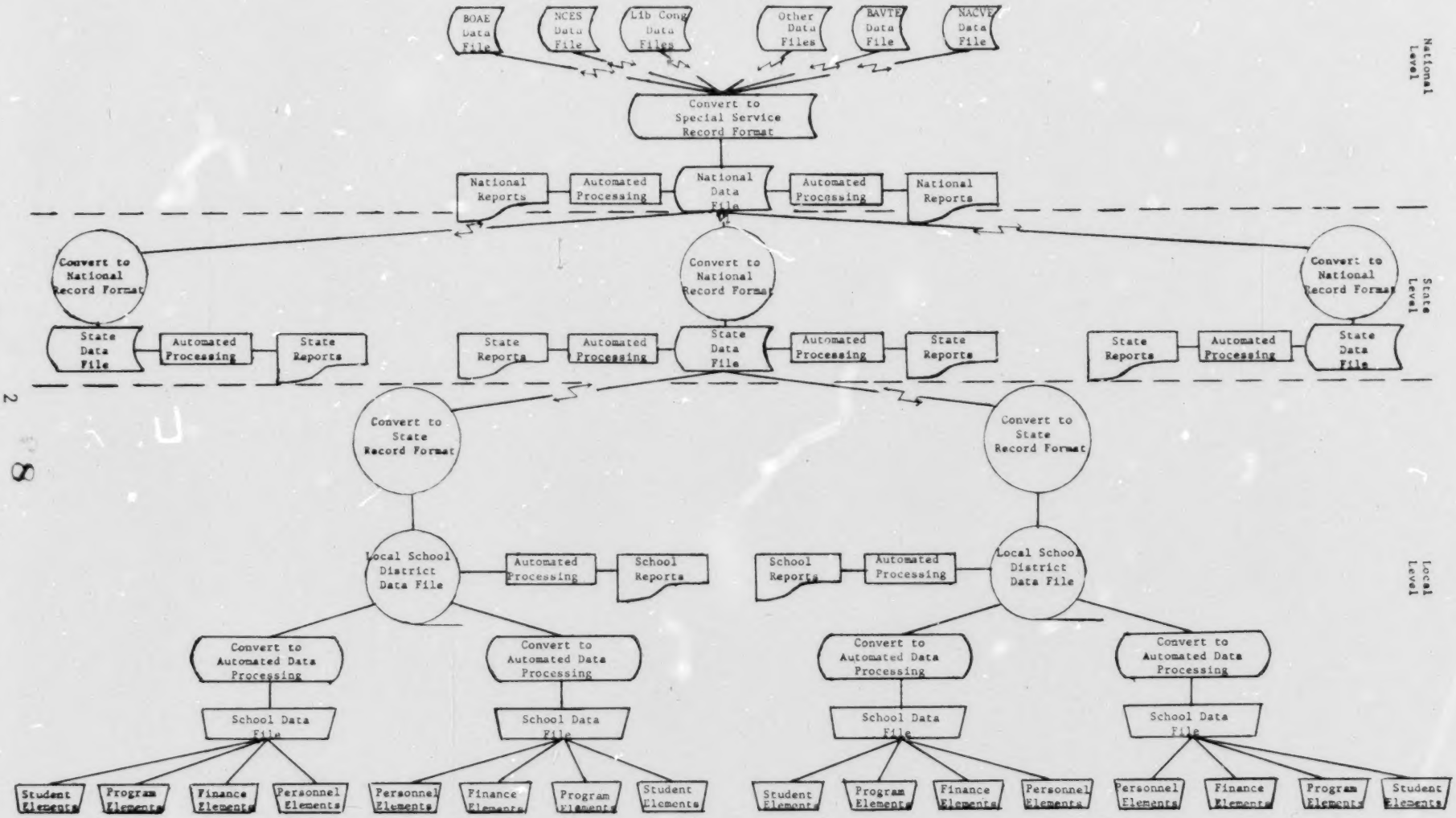
As detailed here, the data base is designed not to replace existing systems but to augment those systems, giving the user at any level of administration automated data in any format desired. The term "data base" in this sense denotes an arrangement under which automated record keeping would supply the needs of users in local education agencies, area offices, State agencies, district offices, and Federal agencies.

The present report deals primarily with a Vocational Education and manpower training data base. It is designed, however, to contain as much of the Nation's current educational information as its users may want to include. The Project Baseline staff recommends that it be developed to include, but not be limited to, Vocational Education.

The authors wish to make clear that in using terms such as "data base", "information system", and "management information system" they are not referring to a particular combination of hardware, software, input forms, printouts, programming, or other features of what is often designated as an automated system. All kinds of computer equipment, programming, storage and retrieval may be used. Many States have automated vocational management information systems of unique design and considerable sophistication. The procedure described in the following report is not another one of these, nor a duplication of any of them on a National scale.

The purpose of this report is to give the reader an in-depth understanding of what is involved in putting the data base together at each level--local, State, and National.

Data Flow for National Automated
Vocational Education Information System



I. INFORMATION NEEDED

Vocational Education has been a combined Federal, State, and local responsibility since 1917. It was expanded considerably by the Vocational Education Act of 1963 and the Amendments of 1968, and during the same decade Congress created a variety of manpower training programs which in some respect paralleled Vocational Education. In 1974, a new Comprehensive Employment Training Act was passed. New Vocational Education legislation will be considered by Congress in 1975. What is it that Congress needs to know about these programs in making additional legislative and appropriations decisions?

American public education, especially at the high school level and beyond, appears to be moving toward more relevance, practicality, and utilitarian objectives. The student unrest of the sixties may have contributed to this. At the college and university level such a trend is evident in the continuing student demand for technical courses, business, engineering, law, and fields related to medicine, while enrollment in the liberal arts is beginning to decline. At the secondary level it has resulted in more than doubling the percent of students enrolled in Vocational Education courses in the past decade. At both the elementary and secondary levels, career education has become a widely discussed and increasingly implemented redirection of the curriculum.

Another relatively new and disturbing development in American education in recent years is its escalating cost. Increased public resistance to the support of education is evident at every level, especially in local school districts which traditionally bear most of the cost. Somewhat related to this problem is an increasing concern for accountability and PPBS -- Program Planning and Budgeting Systems. PPBS is also related to the growing interest in practicality and utilitarian objectives in education.

Lagging considerably behind the public's concern for economy, efficiency, and practical results, however, has been the means of knowing what actually is taking place. Educational reporting systems until quite recently have been incapable for the most part of providing information other than head counts and expenditures by broad categories. The major exception is in Vocational Education. Categorical support requirements for target populations and provisions for detailed State planning in the 1963 and 1968 Federal legislation have required a series of annual reports from each State to the U.S. Office of Education. Many of the States have used portions of their Vocational Education research funds, Federal and State, to develop automated information systems. These have the advantages of handling large quantities of data in less time and with far greater accuracy than the outdated manual systems used. Still missing, however, is an adequate National reporting system.

Several attempts have been made to establish automated information systems for National reporting, none of them successful. Most administrators and information specialists are still at the question-asking

stage. What does Congress need to know? What does the U.S. Office of Education need to know? Many of the States have not even decided what they need to know in administering their programs.

"What do we need to know" can be answered in two ways: either as statistics compiled from source materials, or as selections of the source materials themselves. The source materials are data elements in the files of local educational institutions or collectable by them. For example, statistics compiled from source materials might include the total number of students by ethnic group at each grade level enrolled in each of eighteen Vocational Education clusters. There are three data elements for each student from which these totals can be developed: ethnic identity, grade level, and the Vocational Education courses in which individual students are enrolled.

The data base described in this report consists of data elements collected at the source. Data elements needed for National reporting are usually common to a management information system at any level. The list below is a basic list containing only those elements needed for reporting three kinds of information -- course, student, and professional personnel -- considered to be essential for Congress and the Office of Education. It will not satisfy everyone, but perhaps those who desire information most will find represented here a substantial part of what they need.

Course Information. What are the public funds buying? What kinds of training are being provided, where, for whom and at what instructional levels? In order to answer these questions, we must know the identity of all training programs and what kinds of students are enrolled in each. We must know their location and the grade levels at which they are taught.

How much instruction is provided in terms of clock hours in each course? In order to know this, the total number of hours the course meets during a semester or year must be known.

Which course sections* are conducted for regular students, and which ones for the handicapped and disadvantaged? The way to know this is to identify every course section as either regular, handicapped, disadvantaged, or handicapped and disadvantaged.

How much does it actually cost to provide the training in each separate course section, not just for instruction and supplies but for administration, facilities, equipment, utilities, janitorial expenses, and other overhead? What part of the cost is paid for by local funds, and by State and Federal funds? The answers can be provided by the local school systems and educational institutions identifying these costs separately for each course and each section.

Fifteen data elements are needed to provide all of the above information except the kinds of students enrolled in each course. Student

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* The terms "course section", "section of a course" and "class" are used interchangeably in this report. They are considered as synonymical.

enrollment is discussed on later pages. The fifteen data elements needed for course information included five which are identification numbers: Course number, section number, school number, school district number, and teacher number. There are actually only twelve items of information about each course to be collected. The entire list, including identification numbers, is as follows:

1. Course Identification Number: The identification number developed by the U.S. Office of Education for each course of study.

2. Section Identification Number: The number of each section of the same course taught in the local school or educational institution.

3. School Identification Number: The identification number developed by the U.S. Office of Education in conjunction with the State Department of Education for each school in the State.

4. School District Identification Number: The identification number developed by the U.S. Office of Education in conjunction with the State Department of Education for each school district in the State.

5. Teacher Identification Number: A unique identification number assigned by the local school or by the State educational agency.

6. Kind of Instruction: The instruction classified into kinds: institutional, cooperative, or work experience.

7. Federal Support Program: The part or parts of the Federal legislation of 1968 under which a particular course section is receiving Federal assistance. (Parts B, C, D, E, F, G, or H)

8. Purpose: The instruction classified into goals; orientation, exploratory, preparatory, or supplementary.

9. Type of Course Section: The instruction classified into types; regular, disadvantaged, handicapped, or disadvantaged and handicapped.

10. Instructional Level: The instruction classified into levels; elementary, pre-secondary, secondary, post-secondary, apprentice, adult, and ungraded.

11. Instructional Time: The actual clock hours of instruction in the section of a course.

12. Direct Cost: The expenditures which can be identified with each section of a course such as the teacher's salary, supplies, and equipment.

13. Indirect Cost: The prorated share of the school's expenses which cannot be identified with any particular section of a course such as administrative costs, capital expenditures, and utilities.

14. Local Cost: That portion of the direct and indirect costs not provided through the State educational agency.

15. State and Federal Cost: That portion of the direct and indirect costs which comes from the State educational agency.

Student and Trainee Information: Who receives the immediate benefits of publicly supported vocational education and manpower training? Who are the students and trainees -- not their personal identities, but their characteristics as individuals? In order to answer, we need to know each person's sex, age, grade level, home zip code number, and achievement record (upper third, middle third, or lower third of the section of the course).

What groups in the population are represented and in what proportions? For this we need to know the type of student (regular, handicapped, disadvantaged), and ethnic group.

What preparation for employment is being provided for groups of students and trainees by age, sex, grade level, and special handicaps or disadvantages. One additional element is needed for this information: the nationally standardized course number of each course in which every student and trainee is enrolled.

How many vocational education students and which ones are members of the vocational youth organizations which seem to have had such a dynamic influence on personal success? This requires one additional element for each student: whether or not he or she is a member of such organizations as DECA, FBLA, FFA, FHA, OEA, or VICA.

What happens to each student and trainee at the end of a training program? In order to know, we must have his or her employment status: whether employed full time in the field for which trained or a related field; employed full time in a non-related field; unemployed or working part time looking for full time employment, or not available for regular employment because of military service, continuing full time in vocational or technical education at a higher level, continuing full time in a non-related post-secondary program, personal choice, or for some other reason.

How well have students and trainees done in their training programs, and what kinds of patterns exist in the success or failure rates of different groups? This can be answered with the elements already mentioned and four more which are listed below to answer other questions.

How do the former students and trainees themselves feel about the training they received, and how do they feel about their employment? In order to answer, two elements are needed: each individual's judgment

about the training received -- whether it was excellent, good, fair, poor or of no value -- and whether he or she is highly satisfied, satisfied, or not satisfied with the job received.

For what kinds of employers do different kinds of students find themselves working, and how much did they earn when they went to work? To answer this, we need to know if the employer in each case is a relative, government agency, private employer, or if the individual is self-employed; and the beginning hourly salary.

Altogether, nineteen data elements are needed to answer all of these questions. Three are identification numbers used in the preceding list: course number, section number, and school number. A fourth identification number is needed for the student subsystem, which is a unique number assigned by the local school and identified with a name only by the local school. Fifteen additional data elements supply the information needed. Following is the list including identification numbers:

1. Course Identification Number: The same six-digit USOE Course number used in collecting information for each vocational or occupationally related course in which the student is enrolled. (See Course Information data element 1)

2. Section Identification Number: The same unique number used to identify each section of the same course being taught in collecting course information. (See Course Information data element 2)

3. School Identification Number: The same standardized number used in collecting course information. (See Course Information data element 3)

4. Student File* Number: A unique number assigned to each student by the local school. It is not the student's school identification number or social security number, but a number that only the local school can relate to school identification number or social security number.

5. Sex.

6. Date of Birth.

7. Grade Level of the Student: Students classified into levels K-6, 7, 8, 9, 10, 11, 12, 13 or 1st year, 14 or second year, apprentice, adult, or ungraded.

8. Type of Student: Students classified into types: regular, handicapped, disadvantaged, or disadvantaged and handicapped.

9. Ethnic Group: Students classified into groups: American Indian,

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* File Number and Identification Number are used interchangeably in this report. They may be considered as synonymical.

Negro, Oriental, Spanish-surnamed American or Other.

10. Address: Home zip code only.

11. End of Course Status: Left prior to end of course without a marketable skill, left prior to end of course with a marketable skill, completed course early by examination or advance credit, or completed normal course requirements.

12. Student Achievement: Students classified by vocational achievement; upper third, middle third, or lower third of class.

13. Vocational Club Membership: Students classified as members or non-members of a Vocational Education club.

14. Employment Status After Leaving: Students classified into categories: unknown, not available for placement because of military service; continuing full time in vocational or technical education at a higher level; continuing full time in a non-related post-secondary program, or other; employed full time in field for which trained or related field; employed full time in non-related field; unemployed or working part time looking for full time employment.

15. Employment Satisfaction: Students rating of their job classified into highly satisfied, satisfied, or not satisfied.

16. Vocational Preparation Evaluation: Students' judgment of preparation classified into excellent, good, fair, poor, no value.

17. Employability: Number of weeks available for work between first job application and first job.

18. Earnings: Beginning hourly salary in field in which trained if employed full time.

19. Employer Status: Student's employers classified into self-employed, employed by a relative, by a government agency, or other.

Professional Personnel Information. How many teachers are employed in the Vocational Education and manpower training programs within each occupational area? To answer this, we need identification numbers for teachers and the six-digit USOE courses being taught.

How many vocational counselors, supervisors, coordinators and administrators are employed? For this an identification number and the position classification are needed for each non-classroom teaching vocational educator.

How much professional preparation, vocational employment experience, and vocational teaching experience do they have in relation to their

occupational fields, age, sex, ethnic background, and location? This information requires that the highest professional degree and additional graduate hours be known for each person, the number of years of practical experience, the number of years of vocational teaching or other related professional service, sex, age, and ethnic group.

What are the common characteristics of teachers whose students show high levels of achievement and employability? No additional information is needed to answer this question; it can be answered by writing the necessary computer programs when the data are all entered for processing.

A total of twelve data elements are needed to answer these questions. Five are identification numbers used in the preceding lists. They are as follows:

1. Course Identification Number: The same six-digit USOE Course number used in collecting course information for each course taught (classroom teachers only). (See Course Information data element 1)

2. Section Identification Number: The same unique number used to identify each section of the same course being taught in collecting course information. (See Course Information data element 2)

3. School Identification Number: The same standardized number used in collecting course information. (See Course Information data element 3)

4. School District Identification Number: The same standardized number used in collecting course information. (See Course information data element 4)

5. Personnel File Number: A unique identification number assigned by the local school or by the State educational agency. (For classroom teachers, this is the same Teacher Identification Number used with each course file.) (See Course Information data element 5)

6. Sex.

7. Date of Birth.

8. Ethnic Group: Professional Personnel classified into groups; American Indian, Negro, Oriental, Spanish-surnamed American or Other.

9. Professional Preparation: Professional Personnel classified by completion of highest professional degree and additional graduate credit hours.

10. Vocational Experience: Number of years of practical experience.

11. Vocational Education Experience: Number of years teaching vocational or occupationally related classes, or other related

professional service.

12. Position Classification: Professional personnel classified by position; teacher, administrator, supervisor, coordinator, counselor, or placement officer.

Manpower Training Information. Essentially the same data are needed in an adequate reporting and accountability system for manpower training as for Vocational Education. Instead of the school district and school code identification numbers, unique identification numbers must be provided for each prime contractor and each training agency. These identification numbers may have the letter "M" as their first digit to indicate manpower records rather than Vocational Education records in each State data system and in the National information system. Data element number 1 in the Course, Section and Student Subsystems, the USOE 6-digit code for each course of study, can be changed to the Department of Labor's 6-digit DOT code. Data element number 7 in the Course Section Subsystem, Federal Support Program, can be omitted. Data element number 13 in the Student Subsystem, vocational club membership, can be omitted. These are the only variations that need to be made.

2. INFORMATION AVAILABLE

Local School Records. Many of the data elements listed above may be available at the local school level. If they are not available there, they do not exist. It is only possible, without a school-by-school survey, to estimate those which are already available; but this can be done with reasonable accuracy from examining a few schools at random. The results of such a cursory investigation of data elements in automated systems available are shown in Table 1.

A remaining problem with the data elements usually available in local school records is that some of them are not uniform. The course number used to designate woodworking in one school may be used to designate cabinet making or carpentry in another school. The same is true of type of student, since local schools may use different criteria in identifying handicapped and disadvantaged persons. It is also true that schools may use different ways in determining such data elements as Federal Support Program, Purpose, Instructional Time, Direct and Indirect Costs, Local Funds, State and Federal Funds, Grade Level, Ethnic Group, Status at End of Class, Student Achievement, Employment Status, Employment Satisfaction, Vocational Preparation, Professional Personnel Position Classification, Professional Preparation, and Vocational Teaching.

The problem of non-uniform data elements, however, is more severe in some cases than in others. In the first example above, instructional course designations, a great deal of uniformity does exist. Public secondary and post-secondary educational instructional programs in the United States have for the most part developed their instructional programs in concert rather than in isolation. A number of influences are responsible for this: accreditation associations, closely related

Table 1 - Current Collection of Thirty-Eight Essential Data Elements by Thirty-One Large Cities with Data Processing Facilities

| Data Processing Subsystem | General Data Elements | | | | | Course Section Data Elements | | | | |

Table 1 - Continued

| Data Processing Subsystem | Student Data Elements | | |

teacher education programs, the need to accommodate student transfers in an increasingly mobile population, numerous professional networks through which new developments are widely communicated, and in the case of Vocational Education, Federal regulations.

The data elements which lack uniformity are those calling for classifications for which there are no generally accepted criteria. However, this is not at all unusual in statistical reporting. There is almost always a point beyond which most statistical data do not represent strictly uniform source material. Employment market data, for example, are collected and analyzed by the definitions in the Dictionary of Occupational Titles; but the definitions with one or another DOT code varies widely. In educational statistics, school enrollment may mean the total number of students who enrolled in a year, the total number enrolled for a specified period such as three weeks, or something else.

Table 1, therefore, represents the vocational education basic data elements which can reasonably be expected to be available at the local school level and which can conceivably be collected at the present time either manually or through automatic data processing. The problem of what to do about those not available will be discussed later in the section on Implementation. In the meantime, availability of data is one thing and their collection is something else. If each State were to collect these data elements for its own management information system, the task nationally would be greatly simplified.

Data Elements Available in State Agencies. Fortunately, thirty-seven States are collecting some portion of the basic data elements now from the local school systems. These are shown in Table 2. This table contains an unduplicated schematic presentation of all the data elements listed in Course Information, Student and Trainee Information, and Professional Information. The columns checked opposite each State indicate the categories in the corresponding data elements now available in an automated data system. In most cases when the data element is available, all of the categories needed are available. It should be recognized, moreover, that these are unit data elements, not aggregate data, in State Vocational Education agencies. In other words, Table 2 represents a listing of source data now available in machine readable form from thirty-six of the fifty States. Each State must, of course, determine if and under what conditions these source data might be supplied to the Federal Government.

Manpower Training Data. Under the new Comprehensive Employment Training Act (CETA), there is some uncertainty about the kind of information system which will be established. While the legislation was under consideration by Congress, extensive preparations were made by the Department of Labor for a computer operated reporting system. It had several excellent features, but it was being designed to transmit aggregate data only from the training agencies to regional offices and a National information center. These preparations have apparently been abandoned. Efforts are under way to develop a reporting system which would be compatible with the Office of Education's data collection, but again it is not probable that data elements are being considered as the

basis for such a system. Except for MDTA then, the situation at the time this report is being written is that none of the data elements needed for manpower training are available at the State, district, or Federal levels. It is not known what data elements prime sponsors and training institutions will have in their administrative record keeping.

3. PARTIAL AUTOMATION

Even though many of the data elements needed for a National base are not yet available, a partially automated information system can be established almost immediately. It would be capable of handling all the data now collected manually by the U.S. Office of Education. It would be capable of handling additional data, either in aggregate form or as data elements, and these could be increased each year. It would be able to print out more complete tabulations and analyses of data elements from some of the States and school districts than for all of them, representing percentages of the total Vocational Education population. It could speed up the process of Vocational Education data collection and reporting so that information for any school year would be made available to Congress and the public before the end of the next school year. It would provide a continuation of the data base developed by Project Baseline for annual analysis and longitudinal comparisons. As better data became available, especially in basic data element files from an increasing number of States, the system thus established could gradually be replaced by a completely automated data base.

Use of Existing State Systems. Nearly half of the States have automated systems containing all of the student and followup data elements needed for Federal reporting, and the number is increasing each year. Instead of filling in Federal report forms, these States could simply provide their data tapes to a Federal agency. The State reports could be printed out there, and the data would be available for further tabulations and analyses in combination with the data tapes from other States.

Many of the States also have more data elements needed for a fully adequate reporting system as described in Section One, Information Needed, than are required on the Federal report forms. These could be supplied to the Federal agency for additional analyses and reporting. Table 2 shows the extent to which such information is already available as soon as arrangements can be made with each State to collect the data tapes.

Local Automation. Many large school districts and some smaller ones are already processing some of their own records by computer. Nearly all post-secondary educational institutions do so. Whenever basic data elements are not available in machine readable form at the State level some may be collected from such school districts and educational institutions. This is a temporary expedient, involving extra time, effort, and cost; but if it is done through the assistance of the State Vocational Education agency it need not be prohibitive. A number of the

Table 2 - Current Collection of Thirty-Eight Essential Data Elements by Individual States

| States | General Data Elements | | | | | Course Section Data Elements | | | | |

Table 2 - Continued

| States | Student Data Elements | | |

individual classes, students, and professional personnel in the Nation can be included in an automated system in this way within a relatively short time.

Experimental efforts to collect data elements of Vocational Education students on magnetic tape have already been successful, with both local schools and State agencies participating. Two situations tend to exist, however, which have a bearing on the success of getting automated data in this way directly from local schools. One is that while many of the data elements are available they are not in the form needed. Course numbers, for example, are usually the school's own designation rather than the USOE six-digit numbers standardized for the Nation. School districts rarely use the USOE FICE and Universe Code number to designate individual schools, using their own codes instead. This means that considerable conversion from a variety of local coding to the codes specified here will be necessary.

The other situation found in experimental data collection from local schools is that in many cases the tape files are used only for administrative purposes during the school year, not as permanent records. When the school year is completed and all data collected during the year have been processed for the schools' current use, the tapes are wiped clean. This means that for the tapes to be available for use in an information system, arrangements must be made either to collect the necessary data elements during the school year or to have the tapes stored until the necessary data elements can be collected.

Addition of Local Manual Records. The only purpose in collecting any data at all from manual records at the local level would be to increase the value and utilization of the automated data being collected. If only the data elements available from State systems and local computers are tabulated and analyzed, they will represent nothing more than the courses, students, and professional personnel in those particular States and educational institutions. If additional data from other States and educational institutions can be added which make the totals fairly representative, they can be used in determining approximations of reliable National information. It would be preferable to have statistically valid data for each individual State and for the Nation to begin with, as will ultimately be the case. But temporarily the data can be useful if they are only roughly representative. As soon as sampling procedures can be developed and field tested, the collection of manual files should be from samples only.

4. AN AUTOMATED DATA BASE FULLY OPERATIONAL

In each educational and training institution the records containing data elements are generated by the daily activities of the institution. Course information records are produced by individual faculty members, by faculty committees, by departments, and by the administrative and business offices. Student information records are generated in the enrollment

process and updated when additional information is added. Personnel records are established upon employment and updated with each new appointment or assignment.

Using a computer these records can be stored, retrieved, tabulated, and reproduced in a fraction of the time it takes to handle paper files. A considerable number of local school systems are now using computers for some of their record keeping, and more are doing so each year. Very few, however, have combined their computer operations into well-coordinated information systems. Surveys in several States have found that educational data processing equipment is generally under-utilized for purposes suited to their capability. On the other hand, some highly sophisticated systems have been developed, particularly in post-secondary institutions.

The following section of this report describes the way local school systems can use computers to provide record storage, retrieval, tabulation, and reproduction and receive the benefits of a management information and reporting system at the same time. There is nothing particularly unique or original in the system itself. Other systems are using the same basic principles. Input can be by key punch or optical scan forms. Any kind of hardware capable of handling the volume and complexity of the data processing can be used, and this will vary widely from small school systems to large institutions.

The system described here does contain one feature which is not found in many educational information systems: It relates course section data, including direct and indirect costs, to both student and professional personnel characteristics so that cause and effect relationships between elements in any of the subsystems can be found. This kind of information is essential in management, guidance and counseling, full reporting and accountability. It is essential also in transmitting data elements from the local school systems to State agencies and from the States to a Federal agency for adequate tabulations, analyses, and reporting at these levels.

The only data included in the system here are the basic elements listed in the first section of this report. Local school systems will almost certainly need a great many more data elements in their records, and most States will also require more than these. It is not improbable that the U.S. Office of Education, the Manpower Administration, and Congress will find that some additional elements are needed. On the other hand, some of the elements now listed may not be necessary in the future. In either case, data elements can be added or dropped from the system at any time.

Procedures at the Local Level. Virtually any automation of school records now being used can be the basis of a satisfactory information system by adding elements as needed. If a school is going into automation for the first time, the procedures suggested here may be helpful. If some elements are already being collected for processing by computer, the others can be added. If course section, student, and personnel records are automated but not linked in a coordinated retrieval and analysis system, the linkages, too, can be added. All that is suggested here is one way to design an educational institution's automated record keeping system

so that all of the management information and reporting needed at the National level can be provided.

The overall system is composed of three subsystems as indicated by the list of data elements. Cost information is included within the course section subsystem. The subsystems are based upon series of data files each beginning where the former one ended but identified with the former by a common number such as course section number, student number, or personnel number. This serves as an entry number in the data processing procedures. Table 3 shows each data file in relation to the three subsystems and in its proper sequence.

When fully automated the local institution should collect the data elements by their respective categories as shown in Tables 4, 5, and 6. These are identical with the lists of data elements on pages 4-9, but showing the sequence of files when the system is in operation. A school district with its own system using a different set of files or a different sequence does not have to change to what is suggested here. This is simply a logical way to organize the system, but there would be other ways. Any school can have its own system, provided only that it is capable of collecting and transmitting the basic data elements. If a school has no system and no previous recommendations, these suggestions may be used to develop a satisfactory system.

In any case, each local institution should have the data elements listed for the categories in its data system in machine readable form such as on punch cards, tapes or discs. It should have data processing programs that can maintain (add, delete and correct) these data elements in its system. It should have data processing programs that can readily select data elements for transmission to a State computer. And it should have its own data processing programs for local tabulations and analysis.

For the Course Section Subsystem a Course Section Beginning File consisting of data elements 1-10 of Table 4 is filed at the beginning of each section of a course by the local school system with the State Vocational Education Agency (SVEA) and updated periodically. At the end of the section of a course the local school system files a Course Section Ending File consisting of data elements 1, 2, 3, and 11 of Table 4 with the SVEA. Within 5 months after the end of the reporting year the local school system files a Course Section Cost File consisting of data elements 1, 2, 3, and 12-15 of Table 4 with the SVEA.

For the Student Subsystem a Student Beginning File consisting of data elements 1-10 of Table 5 is filed by the local school system with the SVEA at the beginning of each section of a course for each student and for each late enrollee. Upon the withdrawal of any student and at the end of the section of a course the local school system files a Student Ending File consisting of data elements 1, 2, 3, 4 and 11-13 of Table 5 with the SVEA. Six months after the end of the reporting year the local school system files a Student Followup File consisting of data elements 1, 2, 3, 4 and 14-19 of Table 5 with the SVEA.

For the Professional Personnel Subsystem a Professional Personnel File is sent by the local school system to the SVEA at the beggining of each

Table 3

Vocational Education Automated
Data Processing Files

Subsystem	Data File Name	General Preparation Instructions
Course Section	1 Course Section Beginning File	Filed at Beginning of Section of a Course
	2 Course Section Ending File	Filed at End of Section of a Course
	3 Course Section Cost File	Filed within 5 Months after Close of Reporting Year
Student	1 Student Beginning File	Filed at Beginning of Section of a Course and as Late Enrollees Join the Section
	2 Student Ending File	Filed as Early Terminees Leave the Section of a Course and at End of the Section
	3 Student Followup File	Filed 6 Months after Close of Reporting Year
Professional Personnel	Professional Personnel File	For Classroom Teaching: The Complete Form is Filed with First Section of a Course Taught. Thereafter, only Elements 1, 2, 3, 4, and 5 are Filed with each Successive Beginning Section of a Course File. For Non-Classroom Personnel: Only Elements 3-12 are Filed at Beginning of the Reporting year.

Table 4

Course Section Subsystem Dimensional and Enumerated Elements

Data Source	Element No.	Element Name	Instructions for Reporting an Element in an Information System
Course Section Beginning File	1	Course Identification Number: Standard Terminology for Curriculum and Instruction, Handbook VI	Use only one of the categories into which the vocational instruction program has been classified in "Standard Terminology for Curriculum and Instruction in Local and State School System, Handbook VI" of State Education Records and Reports Series, by the National Center for Educational Statistics, commonly referred to as USOE Taxonomy Code Number. Use the first 6 of the 10 digits.
	2	Course Section Identification Number	Insert the section number assigned by the school for each section of a given course. The course identification number is listed in data element 1. The school identification number, course identification number and section identification number, create a unique number for each section throughout the State.
	3	School Identification Number	For public schools insert the unique school universe number of 5 digits, which is used to identify each public school in the State, for each section of a given course. This number is assigned by the National Center for Educational Statistics in conjunction with the State Department of Education. For institutions of higher education insert the unique FICE (Federal Interagency Committee on Education) number of 6 digits, which is used to identify each institution of higher education in the U.S., for each section of a given course. This number is assigned by the National Center for Educational Statistics and is the code number contained in the Educational Directory-Higher Education.
	4	School District Identification Number	For public school districts insert the unique school district universe number of 5 digits, which is used to identify each public school district in the State, for each section of a given course. This number is assigned by the National Center for Educational Statistics in conjunction with

Table 4 - Continued

Data Source	Element No.	Element Name	Instructions for Reporting an Element in an Information System.
			the State Department of Education. For institutions of higher education insert the unique FICE (Federal Interagency Committee on Education) number of 6 digits, which is used to identify each institution of higher education in the U.S. for each section of a given course. This number is assigned by the National Center for Educational Statistics and is the code number contained in the Educational Directory-Higher Education.
	5	Teacher Identification Number	Insert the unique teacher number, assigned by either the school, the school district, or the State which is used to identify each teacher with each section of a course the teacher teaches.
	6	Kind of Instruction: Cooperative Institutional Work Experience	Use only one of the categories: cooperative, institutional, or work experience (classifications by kind of instruction) for each section of a course.
	7	Federal Support Program: Part B - State Vocational Education programs Part C - Research and Development in Vocational Education Part D - Exemplary Programs and Projects Part E - Residential Vocational Education Part F - Consumer and Homemaking Education Part G - Cooperative Vocational Education Programs Part H - Work-Study Programs for Vocational Education Students	Use one or more of the categories: Part B, C, D, E, F, G, or H, (classification by source of Federal funds by the Vocational Education Act) for each section of a course.

Table 4 - Continued

Data Source	Element No.	Element Name	Instructions for Reporting an Element in an Information System
	8	Purpose: Orientation Exploratory Supplemental Preparatory	Use only one of the categories: orientation, exploratory, supplemental, or preparatory (classification by purpose) for each section of a course.
	9	Type of Course Section: Regular Disadvantaged Handicapped Disadvantaged and Handicapped	Use only one of the categories: regular, disadvantaged, handicapped, or disadvantaged and handicapped (which is the classification for type of course section) for each section of a course.
	10	Instructional Level of Course Section: Elementary Pre-secondary Secondary Post-secondary Apprentice Adult Ungraded	Use only one of the categories: elementary, pre-secondary, secondary, post-secondary, apprentice, adult, or ungraded (classification by grade level) for each section of a course.
Course Section Ending File	11	Instructional Time	Insert the total number of clock hours of instruction (from the opening date to the closing date) for each section of a course. Cooperative experience time may be included in instructional time up to, but not exceeding, the in-school instruction time it replaces.
Course Section Cost File	12	Direct Cost	Insert the total cost for operating each specific section of a course for the duration of the section of the course (from the opening date to the closing date of said section of a course). It is the total expenditure which can be identified with each specific section of a course.
	13	Indirect Cost	Insert the total indirect cost for operating each section of a course for the duration of the section of a course (from the opening date to the closing date of said section of a course). This is the prorated share of the total expenditures which cannot be identified with any specific section of a course.

Table 4 - Continued

Data Source	Elements		Instructions for Reporting an Element in an Information System
	No.	Name	
	14	Local Cost	Insert the local educational agency share of the cost for operating each section of a course. It is the expenditure (both direct and indirect) for the operation of each section of a course from local revenue.
	15	State and Federal Cost	Insert the State and Federal educational agencies share of the cost for operating each section of a course. It is the expenditure (both direct and indirect) for the operation of each section of a course from State and Federal revenues.

Table 5

Student Subsystem Dimensional and Enumerated Elements

Data Source	Elements		Instructions for Reporting an Element in an Information System
	No.	Name	
Beginning Student File	1	Course Identification Number: Standard Terminology for Curriculum and Instruction, Handbook VI	Use only one of the categories into which the vocational instruction program has been classified in "Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI" of State Educational Records and Reports Series by the National Center for Educational Statistics, commonly referred to as USOE Taxonomy Code Numbers. Use the first 6 of the 10 digits.
	2	Course Section Identification Number	Insert the section number assigned by the school for each section of a given course with each teacher who teaches the section. The course identification number is listed in data element 1. The school identification number, course identification number, and the section identification number create a unique number for each section.
	3	School Identification Number	For public schools insert the unique school universe number of 5 digits, which is used to identify each public school in the State, for each section of a given course. This number is assigned by the National Center for Educational Statistics in conjunction with the State Department of Education. For institutions of higher education insert the unique FICE (Federal Interagency Committee on Education) number of 6 digits, which is used to identify each institution of higher education in the U.S., for each section of a given course. This number is assigned by the National Center for Educational Statistics and is the code number contained in the Educational Directory-Higher Education.
	4	Student File Number	Insert the unique student number, assigned by either the school, the school district, or the State which is used to identify each student.

Table 5 - Continued

Data Source	Elements No.	Elements Name	Instructions for Reporting an Element in an Information System
	5	Sex: Female or Male	Use only one of the categories: female or male (classification by sex) for each student.
	6	Date of Birth	Insert 2 digit numerical values for month, and 2 digit numerical values for year respectively. (January 1955 = 0155)
	7	Grade Level of the Student: K thru 6, 7, 8, 9, 10, 11, 12, 13 or 1st Year, 14 or 2nd Year, Apprentice, Adult, Ungraded	Use only one of the categories: K thru 6, 7, 8, 9, 10, 11, 12, 13 or first year, 14 or second year, apprentice, adult, or ungraded (which is the classification for grade level) for each student.
	8	Type of Student: Regular, Disadvantaged, Handicapped, Disadvantaged and Handicapped	Use only one of the categories: regular, disadvantaged, handicapped, or disadvantaged and handicapped (classification by type of student) for each student.
	9	Ethnic Group: American Indian, Negro, Oriental, Spanish-surnamed American, Other	Use only one of the categories: American Indian, Negro, Oriental, Spanish-surnamed American, or Other (classification by ethnic group) for each student.
	10	Address	Insert the zip code number of the home of each student. If student left home for training, insert zip code number of home before training.
Ending Student File	11	End of Course Section Status: Left prior to end of course without marketable skill; Left prior to end of course with marketable skill	Use only one of the categories: Left prior to end of a course without marketable skill; left prior to end of a course with marketable skill; completed course early by examination or advance credit; or completed normal course requirements (classification by status at end of a section of a course) for each student.

Table 5 - Continued

Data Source	Elements No.	Elements Name	Instructions for Reporting an Element in an Information System
		Completed course early by examination or advance credit Completed normal course requirements	
	12	Student Achievement: Upper Third Middle Third Lower Third	Use only one of the categories: upper third, middle third, lower third of section of a course (classification by teacher evaluation of student achievement) for each student.
	13	Vocational Club Membership	Insert the numerical number 1 for each student who is a member of a vocational club.
Followup Student File	14	Employment Status after Leaving: Unknown Not available for placement in labor force because of: Armed forces, Continued full time study in Vocational-Technical Post-secondary, Continued full time study in other Post-secondary, Personal Choice, Other Reasons; Employed Full Time in Field Trained, Related Field, Other Field; Unemployed or employed part time looking for work.	Use only one of the categories: unknown; not available for placement in labor force because of Armed Forces, continued full time study in vocational-technical post-secondary, continued full time study in other post-secondary, personal choice, or other reasons; employed full time in field trained, related field, or other field; or employed part time looking for work; (classification by employment status) for each student.
	15	Employment Satisfaction: Highly Satisfied Satisfied Not Satisfied	Use only one of the categories: highly satisfied, satisfied, or not satisfied (classification by student evaluation of employment satisfaction) for each student.

Table 5 - Continued

Data Source	Elements No.	Name	Instructions for Reporting an Element in an Information System
	16	Vocational Preparation Evaluation: Excellent Good Fair Poor No Value	Use only one of the categories: excellent, good, fair, poor, or no value (classification by student evaluation of vocational preparation) for each student.
	17	Employability	Insert the number of weeks the student was available for work before obtaining the first job for each student.
	18	Earnings	Insert beginning amount earned per hour in field in which trained.
	19	Employer Status: Self Relative Government Agency Other	Use only one of the categories: self, relative, government agency, or other (classification by employer status) for each student.

Table 6

Professional Personnel Subsystem Dimensional and Enumerated Elements

Data Source	Elements		Instructions for Reporting an Element in an Information System
	No.	Name	
Professional Personnel File	1	Course Identification Number: Standard Terminology for Curriculum and Instruction Handbook VI (Teaching Personnel only)	Use only one of the categories into which the vocational instruction program has been classified in "Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI" of State Educational Records and Reports Series by the National Center for Educational Statistics, commonly referred to as USOE Taxonomy Code Numbers. Use the first 6 of the 10 digits.
	2	Course Section Identification Number (Teaching Personnel Only)	Insert the section number assigned by the school for each section of a given course with each teacher who teaches the section. The course identification number is listed in data element 1. The school identification numbers, course identification number, and the section identification number, create a unique number for each section.
	3	School Identification Number	For public schools insert the unique school universe number of 5 digits, which is used to identify each public school in the State, for each section of a given course. It is assigned by the National Center for Educational Statistics in conjunction with the State Department of Education.
	4	School District Identification Number	For institutions of higher education, insert the unique FICE (Federal Interagency Committe on Education) number of 6 digits, which is used to identify each institition of higher education in the U.S., for each section of a given course. This number is assigned by the National Center for Educational Statistics and is the code number contained in the Educational Directory-Higher Education.
	5	Personnel Identification Number	Insert the unique personnel number assigned by either the school, the school district or the State which is used to identify each local classroom teaching and non-classroom personnel.

Table 6 - Continued

Data Source	Elements No.	Instructions for Reporting an Element in an Information System
	6 Sex: Female or Male	Use only one of the categories: female or male (classification by sex) for each local professional personnel.
	7 Date of Birth	Insert two digit numerical vlaues for month and two digit values for year respectively. (January 1955 = 0155)
	8 Ethnic Group: American Indian Negro Oriental Spanish-surnamed American Other	Use only one of the categories: American Indian, Negro, Oriental, Spanish-surnamed American, or Other (classification by ethnic group) for each local professional personnel.
	9 Professional Preparation: No Degree Associate Degree Bachelor Degree Master Degree Doctor Degree	For Bachelor degree or higher: Insert the highest professional degree received and the number of graduate semester hours earned beyond that degree (Bachelor Arts + 30 graduate semester hours = BA030) For less than Bachelor degree: Insert the degree status and the number of undergraduate semester hours earned toward a Bachelor degree (No Degree with 105 undergraduate semester hours toward degree = ND105) (Multiply quarter hours by 2/3 to convert to semester hours)
	10 Vocational Experience	Insert the number of years of practical experience in the teaching field, excluding the education field, for each local professional personnel.
	11 Vocational Education Experience	Insert the number of years of vocational education experience for each local professional personnel
	12 Position Classification: Teacher Administrator Supervisor Coordinator Counselor Placement Officer	Use only one of the categories: teacher, administrator, supervisor, coordinator, counselor, or placement officer (classification by professional personnel).

section of a course. The first time it is filed for each teacher it consists of data elements 1-12 of Table 6. The second and each succeeding time that a Professional Personnel File is filed for a teacher it consists of only data elements 1, 2, 3, 4 and 5 of Table 6. A Professional Personnel File consisting of Data elements 3-12 of Table 6 is filed at the beginning of the reporting year for non-classroom-teaching Vocational Education personnel by the local school system with the SVEA. When teachers are replaced during the normal course period, updated Professional Personnel files are sent to the SVEA as soon as it is evident that the substitutes will last until the end of the course or longer.

Procedures at the State Level. When fully automated each State Vocational Education agency will have the necessary hardware and software to receive and process the data elements needed for its own management information system, and for transmission by tape or disc pack of the basic elements needed at the Federal level. Transmission from local schools' systems to the State agency may be by preprinted form, punch card, magnetic tape, disc pack, or through direct on-line terminals.

Upon receipt of each Course Section Beginning File from the local school system, the SVEA enters data elements 1-10 of Table 4 in its Course Section Subsystem. In like manner, upon receipt of a Course Section Ending File, the SVEA enters data element 11 of Table 4 in its Course Section Subsystem through the Section of a Course computer identification number which consists of data elements 3, 1, and 2. It takes course identification number, course section identification number and school identification number to create a computer identification number for a section of a course in the State data system. In a like procedure, upon receipt of the Course Section Cost File from a local school system the SVEA enters data elements 12-15 of Table 4 in its Course Section Subsystem through the same computer identification number. When all local school course section files are entered, a complete data file exists in the SVEA automated information system for each Vocational Education course section in the State.

Upon receipt of the Student Beginning File from a local school system, the SVEA enters data elements 1-10 of Table 5 in its Student Subsystem. In like manner, upon receipt of the Student Ending File, the SVEA enters data elements 11-13 of Table 5 in its Student Subsystem through a student computer identification number which consists of data elements 3, 1, 2 and 4. It takes school identification number, course identification number, course section identification number, and student identification number to create a unique student number for a specific section of a course in the State data system. In like procedure, upon receipt of Student Followup Files from the local school system, the SVEA enters data elements 14-19 of Table 5 in its Student Subsystem through the same student computer identification number. When all local school student files are entered, a complete data file exists in the SVEA automated information system for each Vocational Education student in the State.

Upon receipt of the first Professional Personnel File of a teacher from a local school system the SVEA enters data elements 1-12 of Table 6 in its Subsystem. Upon receipt of the second and each succeeding Professional Personnel File for a teacher from a local school system, the SVEA enters data elements 1, 2, 3, 4 and 5 through a professional

personnel computer identification number (consisting of data elements 3 and 5). It takes school identification number and personnel identification number to create a unique personnel number in the State information system. Upon receipt of the Professional Personnel File of non-classroom professional vocational educators from each local school system, the SVEA enters data elements 3-12. When these are all received, data files exist in the SVEA automated information system for each vocational educator in local school systems in the State.

As noted above, the SVEA will receive these elements in the form of preprinted forms, punch cards, magnetic tape, disc packs, or directly on-line. Arrangements must be made with each local school system to provide data processing programs to maintain (add, delete, correct) the data elements supplied. Periodically the SVEA will receive update files from each school, and will have data processing programs that can update their own data system. They will also have data processing programs that can readily select from these data, the elements needed for transmission to the National Vocational Education information system.

Procedures at the Federal Level. When fully automated, an agency of the Federal Government will have the necessary equipment, programming software, and operations personnel to receive the same basic data elements shown in Tables 4-6 as the States receive. Again, depending on the circumstances in each individual State, transmission may be by punch card, magnetic tape, disc pack, or direct on-line.

Upon receipt of a Course Section Beginning File from an SVEA, the Federal agency enters data elements 1-10 of Table 4 in its Course Section Subsystem. No additional course section updating information is transmitted by the SVEA to the Federal agency until the following February, when updated files for data elements 1-10 are substituted for those previously sent. A second updated file including data element 11 is transmitted by each SVEA to the Federal agency at the end of the reporting year, and a third including data elements 12-15 six months later. Updating is thus carried out periodically in the Federal agency by substituting complete sections of the Course Section Subsystem, or the entire subsystem, for previous data files which are then discarded.

When all State Course Section files are entered, a complete basic data file exists in the Federal information system for each occupationally related course section in the public schools of the United States. If a statistical sample is used rather than the universe, the data elements in the sample represent all of the sections of courses. The computer identification number for any particular course section is the State code number followed by data elements 3, 1, and 2. It takes a State code number, school identification number, course identification number, and course section identification number to create a unique course section number in the Federal information system.

Upon receipt of a Student Beginning File from an SVEA, the Federal agency enters data elements 1-10 of Table 5 in the Federal Student Subsystem. Updating is handled in the same way as with course section files. In February a new set of files for data elements 1-10 are transmitted from the SVEA's to the Federal agency, replacing those previously sent. At the end

of the reporting year, new sets of files including data elements 11-13 replace the previous Student Subsystem, and seven months later a third updated Student Subsystem including data elements 14-19 replaces that one.

When all State Student Files are entered, a complete basic data file exists in the Federal information system containing statistical data about each Vocational Education or occupationally related student in the public schools of the U.S., or in a statistical sample of all such students. The computer identification number for each student is the State code number, school identification number, course identification number, course section identification number and student identification number to create a unique student number for a specific section of a course in the Federal information system.

The same transmittal and updating procedures are followed with Professional Personnel files. The first files received by the Federal agency contain all of the data elements of Table 6 for classroom teachers and all except element 1 and 2 for non-classroom professional personnel. These are replaced by updated files at the end of the reporting year, and the previous files discarded. It takes a State code number, school identification number, and personnel identification number to create a unique personnel number in the Federal information system. When all State Professional Personnel files are entered in the Federal information system, a complete data file exists containing basic statistical data about each professional vocational educator or of a statistical sample in local schools throughout the U.S.

There are two features of considerable importance in the Federal information system which may not be true of the State systems and are never true of a local school system:

1. Student identification numbers are not the same as those used by the local schools and probably supplied by them to each State agency. They are unique numbers assigned to each student file, and each State or local agency maintains a key through which the two sets of numbers can always be linked together by the originating agency. It is possible that in some States the actual number through which individual students can be identified by name will be retained by the local schools themselves, and non-identifying unique numbers will be assigned at that level for use by the State agencies and the National agency. This is the way confidentiality of student information is absolutely protected.

2. In all probability the complete course section records, student records, and professional personnel records in each State will not be transmitted to the National center for tabulation and analysis. Instead, stratified random sampling procedures may be used to permit transmittal of only a fraction of the records. The sample must be statistically valid for all groups and subgroups within the Vocational Education population in every State, and must be capable of showing valid relationships among any of the course sections, student, and professional personnel data elements with any others. The smallest sample meeting these requirements may be used.

When completed, a statistically valid sample of the unit files of each Vocational Education course section, student, and professional person

in the United States will exist in a National information center. The National center will have facilities for both receiving and delivering statistical data, as well as the processing necessary to satisfy requests of the U.S. Office of Education, Congress, and other agencies. Access to the data through additional individual programming for research purposes should be available to educators and other researchers.

Delivery of statistical tabulations, summaries, and updating reports is through periodic printouts for the most part. It may be advantageous, however, to maintain at least selected data elements on-line for remote terminal access by agencies in the U.S. Office of Education, the Manpower Administration, the Library of Congress, and certain Congressional Committees. In this case, a group of programs will be prepared and maintained on-line with the data which will generate answers to a list of the questions expected to be asked.

Manpower Training Provisions. Virtually identical procedures could be followed by the manpower training agencies, the prime sponsors, and the U.S. Department of Labor as have been suggested here for local educational institutions, State agencies, and the U.S. Office of Education. The very slight variations in data elements suggested in Section 1 could be supplemented at each level by the addition of elements felt to be needed for administrative purposes. By using common data elements, uniform definitions, and standardized coding for both Vocational Education and manpower training records, the data can be merged for tabulation and analysis at any level. If this is done at the National level only, State and regional data as well as National data can be generated showing the total impact of these Federally supported programs geographically and by political subdivisions. These can, in turn, be given to the State and regional offices where they are needed.

5. IMPLEMENTATION

Section 1 of this report identifies the data elements needed for a satisfactory data base. Section 2 identifies those available in the local schools and in machine readable form in each of the States. Section 3 suggests how the data elements already available may be used in a partially automated information system almost immediately. Section 4 describes the ultimate data base -- the local, State, and National automated information systems through which a data base would be fully operational. This section, Section 5, contains a plan for getting from the situation described in Section 2 to that described in Section 4. How do the local schools, the individual States, and the Federal Government proceed from where they are now to a fully operational data base for Vocational Education and manpower training?

First Year. Implementation of the completely automated data base can begin with the partially automated information system described in Section 3. There are several benefits to be realized from this approach. The data thus collected can be tabulated and analyzed as representing whatever percent of the total they are found to be, and even if they are not

statistically representative, they will nevertheless be useful. Each year thereafter, as the number and extent of data elements available increases, the percent of the total represented will increase and become increasingly significant.

It is also necessary to begin immediately identifying data elements not available in each local school and each State, so that efforts may be initiated to begin collecting these data. Experience will be gained at each level in developing adequate information systems to supply the data and make them available. This is the only way accurate and complete information about hardware and software required, staffing needed, and both initial and operations costs can be collected and verified.

Detailed information about equipment, programming, staffing, and costs are needed at the outset. They should be determined for the complete system, and for each of its components, to whatever extent is possible the first year. This involves a complete National inventory of educational data processing. From an accurate knowledge of the kind, location and size of all existing hardware and the Vocational Education record-processing now being performed, projections can be made of what is still needed. Costs can be developed from the projected needs.

A stratified random sample of the data elements needed should be developed and field tested. Sampling techniques are needed at the National level to facilitate handling of large quantities of data, but the sample must be drawn in such a way as to provide representative data for tabulation and analysis for each State and for a variety of groups in the student population. It must be capable of representing program costs by instructional unit at the State level and for clusters or groups of occupational programs. It must have the capability of relating each data element to every other data element in State and National analyses. When an apparently satisfactory sample has been developed, it can be field tested against the total student population, course section information, and professional personnel records of several States which have these data in machine readable form. If the sample then requires modification, that can be done and the field testing performed again until completely satisfactory.

Since all of the developmental work for this data base has been performed by Project Baseline in Flagstaff and Phoenix, Arizona, it will be necessary to transfer the National computer operations at some time thereafter to Washington, D.C. The Office of Education has no data processing equipment, and the Department of HEW has inadequate equipment for remote terminal on-line access if this is found to be advisable. The U.S. Office of Education has a system called Edstrat of inter-connecting computer terminals in a number of major cities throughout the United States.

This and possibly other Government owned data processing facilities in Washington should be explored. Arrangements must be made for multiple agency use when the data base is operational to include the Office of Education, the Manpower Administration, the Library of Congress, and the Congressional Committees. Accurate cost data must be obtained for setting up the data base and for its continuing operation, based on the estimated quantity of data each year over a period of several years and the programming

and output needed. All of these arrangements and costs should be determined during the first year of implementation for decisions to be made the following year.

Finally, the means of building a common data base for both Vocational Education and manpower training should be thoroughly investigated. It is essential that this be done as early as possible before the administration and reporting procedures in the new CETA programs are fully developed. A united effort should be undertaken by the U.S. Office of Education, and the Manpower Administration to work with each of the Governor's Manpower Advisory Councils and each of the prime sponsors to establish the record-keeping and data element transmittal procedures necessary for a common data base.

The Second and Subsequent Years. The second year of implementation should include two major activities: Expanding Vocational Education data collection from States and local schools capable of supplying them; and several policy and administrative decisions by Congress and the Federal agencies based on information obtained the first year.

Data collection can be expanded through additional State automation, and through additional participation by local schools in States where automation has not yet been developed. It should also be possible to use the sampling techniques developed the first year. Data elements from local schools should then include those available from manual files as well as from automated systems. Theoretically, it would be possible to have all of the data elements required in a sample in every State in the Nation by collecting them in machine readable form when they are available that way and in manual form to be keypunched otherwise for entry into State systems. Practically, it would not be possible without a very great expenditure of funds to do so. There are other restraints also, such as approval by local, State and Federal agencies of the collection arrangements needed. A substantial expansion each year should be possible, and the number of years required to reach completion of the sample can be determined with some degree of reliability after the sample has been developed and after the first year's experience in data collection at the local school level.

In the meantime, local school districts and educational institutions which do not have all of the basic data elements in their own systems should be asked to consider revising their enrollment and other record forms accordingly. State educational agencies in such States should be asked to consider requiring all schools to begin maintaining records which include the basic data elements. When it is known to what extent the basic data elements cannot be supplied by local schools and educational institutions without revision of their record forms and procedures, and the cost of such revisions within each State can be estimated, Congress should be asked to consider compensatory legislation for that purpose.

The decisions which should be made the second year, and which can be made on the basis of the first year's experience and information gained are as follows:

A. Knowing the approximate cost of installing and operating the

data base, does Congress want it done?

B. How much of the cost of installation, and how much of the cost of operations, should be paid for by the Federal Government?

C. Are the Office of Education and the Manpower Administration in agreement on content and operations of a common data base for Vocational Education and manpower training?

D. What data processing facilities should be used for the National data base?

E. How should further development be carried out, by what agency or agencies, public or private, and what funds shall be used for this purpose?

6. RECOMMENDATIONS

The Director and staff of Project Baseline have spent three years collecting statistical data about Vocational Education and manpower training. Two years of investigation have gone into the concept of a National automated information system based on data elements generated in the record systems of local schools and training agencies and transmitted in machine readable form to the State and Federal agencies. It is that concept and its complete implementation as described in Section 4 of this report which is recommended to provide a National data base for Vocational Education and manpower training. Specific recommendations for implementation the first year are:

1. Continue to collect Vocational Education student enrollment and followup data elements on magnetic tape or in other machine readable form from each State in which they are available as Project Baseline has done, adding new States as automation increases.

2. Collect Vocational Education program and professional personnel data elements as well as student enrollment and followup from States where these are available in machine readable form at the State level, developing a systematic approach so the same information can eventually be collected in the same way from all States.

3. Continue to collect Vocational Education student enrollment and followup data elements in machine readable form from local school districts and post-secondary institutions in other States where they are available, expanding such collection to include as many institutions as may be reasonable and possible. Undertake to collect data from each State which are representative of courses, students, and professional personnel throughout the State, including where advisable for this purpose data from manual files as well as automated information systems.

4. Prepare additional computer programs for tabulations and analyses of the course section, student, and professional personnel data elements collected to perform the following functions: Printout all reports required for Federal reporting; and provide answers to each of the questions suggested in Section 1 of this report.

5. Complete and provide for periodic update the National inventory of educational data processing equipment and utilization which Project Baseline has already started.

6. Estimate on a school-by-school basis the additional hardware, utilization, and data processing personnel needed in each State to process course, student, and professional staff records containing the basic data elements listed in this Report.

7. Determine as accurately as possible the actual cost of installation and staffing, and also of subsequent operating, the additional equipment needed.

8. Develop and field test a stratified random sample capable of supplying Vocational Education course section, student, and professional personnel data elements representative of occupational clusters or groups of programs, occupational groups of students, and groups of professional personnel by occupational area and preparation, each by State and geographic subdivisions.

9. Explore the most efficient and effective arrangements for moving the present computer operations of Project Baseline into a National data processing facility capable of direct access by the U. S. Office of Education, the Manpower Administration, the Library of Congress, Congressional Committees, and other agencies and individuals.

10. Undertake a unified effort by the U.S. Office of Education and the Manpower Administration to develop a manpower training information system capable of providing the same training, trainee, and instructional personnel basic data elements as shall be collected in Vocational Education so that both systems will supply a common data base for National reporting and accountability.

7. GLOSSARY OF TERMS

Nearly 150 terms have been used in the preceding report which are of a technical nature or require uniform usage. These definitions have been researched and the sources noted. Whenever possible, they are taken from the USOE Handbook series. In cases where no satisfactory definition could be found, the definition found here has been supplied by the Baseline staff.

ADULT - An individual person who has reached a specified minimum legal age of adulthood, usually 18 years of age. (State Educational Records and Reports Series: USOE Handbook VI)

ADULT EDUCATION - Instruction designed to meet the unique needs of adults and youth beyond the age of compulsory school attendance who have either completed or interrupted their formal education. This may be provided by a school system, college, or other agency or institution (including a technical institute or area vocational school). (State Educational Records and Reports Series: USOE Handbook VI)

ADULT EDUCATION PROGRAM - A program of instruction primarily for adults and youth beyond the age of compulsory school attendance. (State Educational Records and Reports Series: USOE Handbook VI)

AGENCY - A business or service authorized to act for others. (American Heritage Dictionary of the English Language)

AGGREGATE DATA - Numbers of students, classes, dollars, or other data which have been derived from two or more separate records. Aggregate data must always be summations of like elements and may include very specific limitations such as the number of black males enrolled in auto mechanics at the secondary level, or may be quite broad such as the total number of all Vocational Education students. (Project Baseline)

AMERICAN INDIAN - Persons considered by themselves, by the school, or by the community to be of American Indian origin. (USOE Form #3138)

APPRENTICE - A worker who is learning a recognized occupation in accordance with a written apprentice-training contract between him and his employer or employers which provides for a given period of planned work experience through employment on the job, supplemented by appropriate related instruction, and with other specified provisions of the arrangement. (State Educational Records and Reports Series: USOE Handbook VI)

APPRENTICESHIP TRAINING - An organized system for providing young people with the manipulative skills and technical or theoretical knowledge needed for competent performance in skilled occupations. The program usually involves cooperation among schools, labor, and management, since apprentices learn the skills of their craft through on-the-job work experiences, and the related theoretical information through classroom instruction. The minimum terms and conditions of apprenticeship are regulated by State and local statutes or agreements. (State Educational Records and Reports Series: USOE Handbook VI)

AUTOMATED DATA SYSTEMS - Information systems in which data are keypunched or otherwise converted to a form capable of being read into automatic data processing equipment for tabulation, analyses, transmittal, and retrieval. In completely automated systems using non-aggregate data elements the information obtained at any point of retrieval cannot have been administratively edited or contaminated. (Project Baseline)

BASIC DATA ELEMENTS - The minimum data elements (minimum specific statistics, facts, information) concerning the course section (activity), student, and professional personnel of Vocational Education needed for tabulation and analysis at the National level by Congress and the U.S. Office of Education in determining policy and administering Federal programs). (Project Baseline)

BLACK/NEGRO - Persons considered by themselves, by the school, or by the community to be of African or Negroid origin. (USOE Form #3138)

CATEGORICAL SUPPORT - Financial aid or assistance contained within an appropriation which, under the authorizing legislation, can only be used for particular purposes or categories. (Project Baseline)

CATEGORY - A specifically defined division in a system of classification. (American Heritage Dictionary of the English Language)

CETA - Comprehensive Employment Training Act.

CLASSIFICATION - A method of grouping or segregating the entire section into classes that have systematic relations usually founded on common properties or characteristics. (Webster's Third New International Dictionary, Unabridged)

COMPLETED/COMPLETER - A previous year Vocational Education student who has been identified by the local reporting agency as having completed normal course or program requirements. (Project Baseline)

COMPUTER - A data processor that can perform substantial computation, including numerous arithmetic and logic operations, without intervention by a human operator during the run. (American National Standard Vocabulary for Information Processing)

COMPUTER IDENTIFICATION NUMBER - The cross reference descriptor in the structure of each course section, student, and personnel file which acts as an identifier of the particular course section, student and personnel so that an interlinking of course section, student, and personnel files permits an analysis of educational issues involving any arrangement of data elements. (Project Baseline)

COOPERATIVE EDUCATION - A combination program of study and practice - conducted on an alternating schedule of half days, days, weeks, or other periods of time - providing legal employment for pupils with organized on-the-job training and correlated school instruction. (State Educational Records and Reports Series: USOE Handbook VI)

COORDINATOR - A staff member performing assigned activities which have the purpose of unifying programs for the accomplishment of common objectives. The coordination of programs may be within the school system or between programs within the school and programs outside the school. (State Educational Records and Reports Series: USOE Handbook IV)

COURSE - An organization of subject matter and related learning experiences provided for the instruction of pupils on a regular or systematic basis, usually for a predetermined period of time (e.g., a semester, a regular school term, or a 2-week workshop). Credit toward graduation or completion of an instructional program generally is given pupils for the successful completion of a course. (State Educational Records and Reports Series: USOE Handbook V)

COURSE IDENTIFICATION NUMBER - A unique number that identifies each vocational instruction course as defined in "Standard Terminology for Curriculum and Instruction Local and State School Systems." (State Educational Records and Reports Series: USOE Handbook VI)

COURSE SECTION - The smallest unit of class instruction in a single course within a single educational institution. May be used interchangeably with the term "class". (Project Baseline)

COURSE SECTION BEGINNING FILE - The initial collection of related records treated as a unit that pertains to the opening of a section of a course as listed in data elements 1-10 of the Course Section Subsystem. (Project Baseline)

COURSE SECTION COST FILE - The collection of related records treated as a unit that pertains to expense involved in the operation of a section of a course as listed in data elements 12-15 of the Course Section Subsystem. (Project Baseline)

COURSE SECTION ENDING FILE - The final collection of related records treated as a unit that pertains to the closing of a section of a course as listed in data element 11 of the Course Section Subsystem. (Project Baseline)

COURSE SECTION IDENTIFICATION NUMBER - A unique number that identifies each section of a course in a school and which will serve as a data entry number in the data processing procedure. (Project Baseline)

DATA BASE - Data elements which constitute the basic file of statistical records needed for program review and administration. (Project Baseline)

DATE OF BIRTH - The numerical number of the month in the year followed by the numerical number of the year in the twentieth century. (Project Baseline)

DATA ELEMENTS - A basic unit of identifiable and definable information. (Federal Information Processing Standards Publication 20)

DEGREE - A title conferred by a college or university as official recognition for the completion of a program of studies or for other attainment. (State Educational Records and Reports Series: USOE Handbook VI)

DICTIONARY OF OCCUPATIONAL TITLES - A document prepared by the U.S. Department of Labor, Manpower Administration, Bureau of Employment Security which provides a classification structure under which most jobs in

the American economy are arranged according to their interrelationships. (Project Baseline)

DIMENSIONAL DATA ELEMENTS - Those which denote characteristics, usually by classifying them into specified categories. (Federal Core of Statistical Data for the Elementary/Secondary Level, Final Report, Volume II)

DIRECT COSTS - Those expenditures which can be easily and readily identified with a specific program. (State Educational Records and Reports Series: USOE Handbook II-B)

DISADVANTAGED AND HANDICAPPED STUDENTS - Students who may be classified simultaneously as both disadvantaged and handicapped. (Project Baseline)

DISADVANTAGED STUDENT - Student who has academic, socioeconomic, cultural, or other handicaps that prevent him or her from succeeding in education programs designed for persons without such handicaps, and who for that reason require specially designed educational programs and related services. The term includes persons whose needs for such programs or services result from poverty, neglect, delinquency, or cultural or linguistic isolation from the community at large. (State Educational Records and Reports Series: USOE Handbook V)

DOT CODE - A numerical six (6) digit occupational classification system used in the Dictionary of Occupational Titles in which the number and position of each digit represents a major or minor subdivision. (Project Baseline)

EARNINGS - Gross hourly wages of previous year Vocational Education students and manpower trainees who are employed full time. (Project Baseline)

EDUCATIONAL INSTITUTION - An organization, establishment, foundation, society or the like, devoted to the promotion of a particular educational objective. (Webster's Third New International Dictionary, Unabridged)

EMPLOYABILITY - The time required between completing a Vocational Education or manpower training program and full time employment measured in weeks. (Project Baseline)

EMPLOYMENT STATUS - The status of Vocational Education completers at the time of collecting followup information in relation to employment, continuing in an educational program, or unavailable for work. (Project Baseline)

ENUMERATED DATA ELEMENTS - Those which count, measure, indicate levels, ranks or amounts (these are usually the entries in the cells of a table). (Federal Core of Statistical Data for the Elementary/Secondary Level, Final Report, Volume II)

ETHNIC GROUP - A group with a common cultural tradition and a sense of identity which exists as a subgroup of a larger society. (State Educational Records and Reports Series: USOE Handbook VIII)

EVALUATION - The worth, excellence, merit or value of a program or activity using an alphabetic, numeric, or percentage scale from highest to lowest. (Project Baseline)

EXPENDITURES - The total charges incurred for the benefit of the current fiscal year, whether paid or unpaid, except for capital outlay and debt service. (State Educational Records and Reports Series: USOE Handbook V, Revised)

EXPERIENCE - Active participation in events or activities leading to the accumulation of knowledge or skill. (American Heritage Dictionary of the English Language)

EXPLORATORY - Courses usually, but not necessarily, below grade eleven, in which students are given an introduction to employment skills in one or more occupational areas for career and interest exploration only, not for employment. (Project Baseline)

FIELD IN WHICH TRAINED - Occupational area in which student received the major share of his training. (Project Baseline)

FOLLOWUP DATA - Information pertaining to the activities of a student following the completion of a Vocational Education program. (Project Baseline)

GOVERNMENT AGENCY - A branch or sub-branch of Federal, State, or local government established under Constitutional or statutory authorization to perform specified functions. (Project Baseline)

GOVERNORS' MANPOWER ADVISORY COUNCILS - (State Manpower Services Council) A council appointed by the Governor of each State to: review, recommend and coordinate plans and services of prime sponsors and State agencies; monitor operation of the programs, and prepare an annual report to the Governor. (Manpower Report of the President - April 1974)

GRADE - A designation applied to that portion of the curriculum which represents the work of one regular school term. In referring to a given course, the term "grade" or "grade level" may indicate that the course normally is intended for students of a given grade. (State Educational Records and Reports Series: USOE Handbook V, Revised)

HANDICAP - An atypical physical, mental or behavioral condition that adversely affects the performance of an individual. (State Educational Records and Reports Series: USOE Handbook VI)

HANDICAPPED STUDENT - Mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, or other health impaired students who by reason thereof require special education and related services. The term also includes students with specific learning disabilities to the extent that such students are health impaired students who by reason thereof require special education and related services. (State Educational Records and Reports Series: USOE Handbook V)

HIGHER EDUCATION - Education above the level of the secondary school, usually beginning with grade 13, which is provided by colleges, universities, graduate schools, professional schools, and technical institutes. (State Educational Records and Reports Series: USOE Handbook VI)

INDIRECT COSTS - Those expenditures which cannot be easily or readily identified with a specific program. (State Educational Records and Reports Series: USOE Handbook II-B)

INSTITUTIONAL INSTRUCTION - Instruction that is conducted exclusively within the classrooms and shops of a school. (Project Baseline)

INSTRUCTION - The activities dealing directly with the teaching of pupils or with improving the quality of teaching. (State Educational Records and Reports Series: USOE Handbook V)

INSTRUCTION, LEVEL OF - An indication of the general nature and difficulty of instruction, e.g., elementary instructional level, secondary instructional level, and post-secondary instructional level. (State Educational Records and Reports Series: USOE Handbook V, Revised)

INSTRUCTIONAL PROCESS - The principal method by which instruction is provided. (State Educational Records and Reports Series: USOE Handbook VI)

INSTRUCTIONAL TIME - Total number of clock hours of classroom, laboratory and shop instruction time, or an equal amount of cooperative experience time, for the section of a course. (Project Baseline)

LEGISLATIVE ACT - The short name, title and section of a Federal legislative act which provides a source of funds, (directly or via the SEA or other channel) to an agency. (Also known as "legislative program") (Federal Core of Statistical Data for the Elementary/Secondary Level, Final Report, Volume I)

LOCAL AUTOMATION - The use of automatic data processing equipment in maintaining and reproducing local school records.

LOCAL COST - School District Cost (Local Support) - That share of direct and indirect costs expended for program support by the local school district. (Project Baseline)

LOCAL SCHOOL RECORDS - Information or data on a particular subject which are collected and preserved in the individual school or school district. (Project Baseline)

MACHINE READABLE - A medium that can convey data to a given sensing device. Synonymous with automated data medium. (American National Standard Vocabulary for Information Processing)

MANPOWER TRAINING - Vocational education activities, provided by a public or private educational institution acting for the U.S. Department of Labor or the U.S. Department of Health, Education, and Welfare through a signed agreement, for unemployed or underemployed persons who cannot

obtain full time jobs with their present skills or who are working below their occupational potential, that equips them with new and improved skills to provide reasonable assurance of employment. (Project Baseline)

MANPOWER TRAINING AGENCY - A public or private educational institution, acting for the U.S. Department of Labor or the U.S. Department of Health, Education, and Welfare through a signed agreement, to provide vocational education activities for unemployed or underemployed persons who cannot obtain full time jobs with their present skills, who are working below their present skills, or who are working below their occupational potential, that equips them with new and improved skills to provide reasonable assurance or employment. (Project Baseline)

MANUAL DATA SYSTEMS - Information systems in which statistical data are collected, tabulated, and transmitted by hand. Automatic calculators and even computers may be used for tabulation and analysis, but if the data are copied by hand and transmitted for further tabulation in written or printed form only, the system is considered manually operated. Opportunity for administrative editing or contamination exists at the point or points where data are entered or transmitted manually in the system. (Project Baseline)

MANUAL RECORDS - Program, student and other data entered in official records through a hand process which in turn can be extracted only through a hand process. (Project Baseline)

MARKETABLE SKILLS - A skill especially and particularly suited to the needs of those engaged or preparing to engage in a particular occupational field which fits the student for useful employment. (Vocational Education Bulletin #1)

MDTA - Manpower Development and Training Act.

MDTA TRAINEE - An unemployed worker approved by the State employment service for and enrolled by a Vocational Education agency in a program to help meet the requirements of available jobs. (Project Baseline)

MIS - Management Information System.

NON-AGGREGATE DATA - Single data elements obtained in each case from separate records. Each non-aggregate data element is a count of one, never a summation of more than one. Non-aggregate data are collected in separate unique files as they relate to individual classes, students, and professional personnel. (Project Baseline)

OCCUPATION GROUP - Occupational Field: A group of recognized occupations having many similarities, including the following characteristics in common: The type of work performed; the basic aptitudes and the acquired knowledge and training required; the tools, machines, instruments, and other equipment used, and the basic materials used. (State Educational Records and Reports Series: USOE Handbook VI)

ORIENTAL - Persons considered by themselves, by the school, or by the community to be of Chinese, Japanese, or other Oriental ancestory. (USOE Form #3138)

OTHER FIELD - Any occupational area other than field trained or related field. (Project Baseline)

OTHER RACIAL/ETHNIC GROUP - Persons of racial extraction other than American Indian, Negro, Oriental, or Spanish-surnamed American. Other includes Caucasian. (USOE Form #3138)

PART B - State Vocational Education Programs - Programs that may qualify for Federal reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Section 122.

PART C - Research and Development in Vocational Education - Programs and projects that may qualify for Federal reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Section 132.

PART D - Exemplary Programs and Projects - Programs and projects that may qualify for Federal reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Section 143.

PART E - Residential Vocational Education - Facilities that may qualify for Federal Reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Sections 151 and 153.

PART F - Consumer and Homemaking Education - Programs that may qualify for Federal reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Section 161.

PART G - Cooperative Vocational Education Programs - Programs that may qualify for Federal reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Section 174.

PART H - Work-study Programs for Vocational Education Students - Programs that may qualify for Federal reimbursement in accordance with State plans for Vocational Education as provided in P. L. 90-576, Section 182.

PARTIAL AUTOMATION - A record or data system in which part of the procedures are automated but at least one step is manual, thus utilizing the advantages of speed and tabulation which computers provide but retaining the opportunity for administrative editing and contamination of data. (Project Baseline)

PERSONNEL, ADMINISTRATIVE - Staff members assigned activities which have as their purpose the general regulation, direction, and control of the affairs of the school system that are systemwide and not confined to a narrow phase of school activity; for example, superintendent of

schools, business manager, and accountant. (State Educational Records and Reports Series: USOE Handbook IV)

PERSONNEL IDENTIFICATION NUMBER - A unique number that identifies each classroom and non-classroom teaching personnel member in a school or a school district and which will serve as a data entry number in the data processing procedure. (Project Baseline)

PLACEMENT OFFICER - A staff member performing assigned professional services having the purpose of assisting students in finding appropriate employment and assisting employers in finding employees with appropriate training. (Project Baseline)

PRACTICAL - Acquired through action, rather than theory, speculation, or ideals. (American Heritage Dictionary of the English Language)

PREPARATORY - Preparation for an entry level competency in one of the occupational clusters, prerequisites for further education, or preparation for career advancement. (Arizona Department of Education)

PRIME SPONSOR - A local government agency located in a city with a population of 100,000 or more, a State government agency, or an existing concentrated employment program grantee which signs an agreement with the U.S. Department of Labor to participate in a CETA program. (Manpower Report of the President, April 1974)

PROFESSIONAL PERSONNEL - A term denoting the level of personnel who have had extensive training in a particular line of work (usually a minimum of a bachelor's degree) and who perform activities regarded as professional by the laws and regulations established by the State or other professional requirements recognized by the State. Examples are superintendents, teachers, architects, lawyers, and nurses. (State Educational Records and Reports Series: USOE Handbook VII)

PROFESSIONAL PERSONNEL FILE - The collection of related records treated as a unit that pertains to the professional personnel as listed in data elements 1-12 of the Personnel Subsystem. (Project Baseline)

PROFESSIONAL PREPARATION - The number of academic years of formal professional preparation and/or the highest professional degree. (Project Baseline)

PRORATING - Prorating is the allocation of parts of an expenditure to two or more different accounts in proportion to the benefits received by the programs or activities of which the accounts are a part. (State Education Records and Reports Series: USOE Handbook II-B)

RANDOM SAMPLE - Random sampling is that form of sampling in which each "primary sampling unit" has the same probability of being included as every other sampling unit. (Statistical Analysis, Samuel B. Richmond)

REGULAR STUDENT - A full time student who is neither disadvantaged nor handicapped. (Project Baseline)

RELATED FIELD - Occupational area requiring many of the same or similar skills as field trained. (Project Baseline)

RELATIVE - A person akin to another by blood or marriage. (American Heritage Dictionary of the English Language)

SATISFACTION - Work environment viewed from the vantage point of the employed student, including overall job satisfaction, and satisfaction with various specific aspects of the individual's work environment, such as his supervisor, his co-workers, his working conditions, hours of work, pay, and type of work. It also includes the satisfaction of his aspirations and expectations, and the similarity of his interests to those of successful persons working in his chosen occupation. (Project Baseline)

SCHOOL - A division of the school system consisting of a group of pupils composed of one or more grade groups, organized as one-unit with one or more teachers to give instruction of a defined type, and housed in a school plant of one or more buildings. More than one school may be housed in one school plant, as is the case when the elementary and secondary schools are housed in the same school plant. (State Educational Records and Reports Series: USOE Handbook V)

SCHOOL - The legal name of the school and its OE ID. (Federal Core of Statistical Data for the Elementary/Secondary Level, Final Report, Volume I)

SCHOOL DISTRICT - A term used synonymously with the term "local basic administrative unit". An administrative unit at the local level which exists primarily to operate public schools or to contract for public school services. Normally, taxes can be levied by such units for school purposes. These units may not be coterminous with county, city or town boundaries. This term is used synonymously with the terms "school district" and "local education agency". (State Educational Records and Reports Series: USOE Handbook VI)

SCHOOL DISTRICT IDENTIFICATION NUMBER - A unique number that identifies each school district in a State and which will serve as a data entry number in the data processing procedure. (Project Baseline)

SCHOOL IDENTIFICATION NUMBER - A unique number that identifies each school in a State and which will serve as a data entry number in the data processing procedure. (Project Baseline)

SCHOOL YEAR - The 12-month period of time denoting the beginning and ending dates for school accounting purposes, usually from July 1 to June 30. (State Education Records and Reports Series: USOE Handbook V)

SEA - State Educational Agency.

SECTION IDENTIFICATION NUMBER - A unique number that identifies each section in a course in a school and which will serve as a data entry number in the data processing procedures. (Project Baseline)

SELF-EMPLOYED - Earning one's living directly from one's own profession or business. (Random House Dictionary of the English Language, unabridged)

SKILLS - Abilities acquired by observation, study, or experience in mental and/or physical performance (e.g., proficiency in planning and investigating, operational techniques, comprehension, organization, execution, remembrance, and application of knowledge to acquire a desired result) basic to the mastery of school work or other activity. (State Educational Records and Reports Series: USOE Handbook VI)

SPANISH-SURNAMED AMERICAN - Persons considered by themselves, by the school, or by the community to be of Mexican, Central American, Puerto Rican, Cuban, Latin American, or other Spanish speaking origin. (USOE Form #3138)

STATE ADVISORY COUNCILS - Advisory councils appointed by the governor or by the State board if elected which have as their function to advise the State board on the development of and policy matters arising in the administration of the State plan, to evaluate Vocational Education programs, services and activities assisted under the provisions of the "Amendments to the Vocational Education Act of 1963," and publish and distribute the results thereof, and prepare and submit through the State board to the Commissioner and to the National Council an annual evaluation report accompanied by such additional comments of the State board as the State board deems appropriate as provided in P. L. 90-576, Section 104. (Project Baseline)

STAFF YEARS OF EXPERIENCE - For any identified staff member, the length of service in years as staff member (other than intern, temporary or for pre-service practice) in any legitimate educational agency. (State Educational Records and Reports Series: USOE Handbook IV, Revised)

STATE CODE NUMBER - The two-digit identification numbering system established by the National Center for Educational Statistics, United States Office of Education, and used in conjunction with the USOE Universe Code and USOE FICE Code Systems. (Project Baseline)

STATE AND FEDERAL AGENCY COST - All expenditures for program support other than local school district costs. (Project Baseline)

STATE PLAN - An agreement between a State board for Vocational Education and the U.S. Office of Education describing (a) the Vocational Education program developed by the State to meet its own purposes and conditions, and (b) the conditions under which the State will use Federal Vocational Education funds (such conditions must conform to the Federal acts and the official policies of the U.S. Office of Education before programs may be reimbursed from Federal funds). (AVA)

STRATIFIED RANDOM SAMPLE - Stratified simple random sampling is that form of sampling in which simple random samples are drawn from each of the

strata and combined into a single estimate. (Statistical Analysis, Samuel B. Richmond)

STUDENT - An individual for whom instruction is provided in an educational program under the jurisdiction of a school or school system. No distinction is made between the terms "pupil" and "student"; the term "pupil" is used to include individuals at all instructional levels. A pupil may receive his instruction in a classroom or a school plant or in another location such as his home or a hospital. Instruction may be provided by direct teacher contact or by some other means such as television or correspondence. (State Educational Records and Reports Series: USOE Handbook V)

STUDENT ACHIEVEMENT - The degree to which the student accomplishes the vocational objective such as a rating of achievement or progress assigned on the basis of some predetermined scale e.g., letters (A B C D F) or words or rank in class. (Project Baseline)

STUDENT BEGINNING FILE - The initial collection of related records, treated as a unit that pertains to the enrollment of a student in a section of a course as listed in data elements 1-10 of the Student Subsystem. (Project Baseline)

STUDENT ENDING FILE - The collection of related records treated as a unit that pertains to the termination of a student in a section of a course as listed in data elements 11-13 of the Student Subsystem. (Project Baseline)

STUDENT EVALUATION - The appraisal by the student of the Vocational Education program in which he or she enrolled to prepare him or her for entry into and success in the labor field. (Project Baseline)

STUDENT FILE NUMBER - A unique number that identifies each student in a school and which will serve as a data entry number in the data processing procedure. (Project Baseline)

STUDENT FOLLOWUP FILE - The final collection of related records treated as a unit that pertains to the activities of a student subsequent to the completion of a preparatory Vocational Education program as listed in data elements 14-19 of the Student Subsystem. (Project Baseline)

STUDENT ORGANIZATION, CLUB - An organized group of pupils having as its main objective the furtherance of a common interest. Such organizations include dramatic, musical, and similar clubs and societies which, with the approval of appropriate school authorities, are managed and operated by the pupils under the guidance or supervision of qualified adults. (State Educational Records and Reports Series: USOE Handbook V)

SUPPLEMENTARY PROGRAM - A program offered as supplemental training to persons already employed for extending and upgrading skills and knowledge in the field in which they are currently employed. (State Educational Records and Reports Series: USOE Handbook VI)

SVEA - State Vocational Education Agency.

TEACHER - A staff member performing assigned professional activities in guiding and directing the learning experiences of pupils in an instructional situation. Subprofessionals such as teacher aides, lab or shop assistants, etc. are not to be considered as teachers under this definition. (State Educational Records and Reports Series: USOE Handbook VI)

TEACHING - The process of helping pupils acquire knowledge, skills, attitudes, and/or appreciations by means of a systematic method of instruction. (State Educational Records and Reports Series: USOE Handbook VI)

UNGRADED CLASS - A class which is not organized on the basis of grade and has no standard grade designation. This includes regular classes which have no grade designations, special classes for exceptional pupils which have no grade designations, and many adult education classes. Such a class is likely to contain pupils of different ages who, frequently, are identified according to grade level or age level. Ungraded classes sometimes are referred to as "non-graded." (State Educational Records and Reports Series: USOE Handbook VI)

UNIVERSE - An inclusive class explicitly containing all the entities to be discussed in a given discourse, investigation, or theory. (Webster's Third New International Dictionary, unabridged)

USOE - United States Office of Education.

USOE FICE CODE - The six-digit identification numbering system established by the Federal Interagency Committee on Education, National Center for Educational Statistics, United States Office of Education, for each institution of higher education and its branches in the United States. (Project Baseline)

UTILITARIAN - Concerned with the practical or material things and interests. (Webster's Third New International Dictionary, unabridged)

VOCATIONAL EDUCATION - Any form of activity conducted as part of a program designed to prepare individuals for gainful employment, or to prepare those who have already entered the labor market and who need training or re-training for stability or advancement in employment, as semiskilled or skilled workers or technicians or subprofessionals in recognized occupations, except those which are designated as preparation for professional workers which require a baccalaureate or higher degree. (Project Baseline)

VOCATIONAL EDUCATION CLUSTER - A group of occupations which are related through similarity in work performed; tools, equipment and materials used; knowledge needed; and mental and physical characteristics required of workers. (Project Baseline)

VOCATIONAL EDUCATION EXPERIENCE - The number of school years of experience within the professional field of Vocational-Technical Education. (Project Baseline)

VOCATIONAL-TECHNICAL EDUCATION - Education in one or more semiskilled, skilled, or technical occupations, provided by a school which is separately organized under the direction and management of an administrator. (State Educational Records and Reports Series: USOE Handbook VII)

VOCATIONAL YOUTH ORGANIZATION - The vocational youth clubs of America open to youth in the various vocational occupations provide additional opportunities to develop leadership, social awareness, civic responsibility and an understanding of the world of work in their vocational occupation as an integral part of the instructional program. Pupils in these organizations engage in activities that extend their interest, skills and knowledge in many aspects of their occupational field. (State Educational Records and Reports Series: USOE Handbook VI)

ZIP CODE - A system designed to expedite the sorting and delivery of mail by assigning a five-digit number to each delivery area in the United States. The first 3 digits indicate a major city or sectional distribution center; the last 2 digits signify a specific Post Office's delivery area within the center. Zip areas do not coincide with census areas and will change according to postal requirements. (Postal Regulations)

USOE UNIVERSE CODE - The five-digit identification numbering system established by the Federal Interagency Committee on Education, National Center for Educational Statistics, United States Office of Education for each public school district and each public school in the United States. (Project Baseline)

VOCATIONAL EXPERIENCE - The number of calendar years of work experience other than professional education experience related to the program content being taught. (Project Baseline)

BIOGRAPHICAL SKETCH OF THE AUTHORS

Arthur Lee, Director of Project Baseline at Northern Arizona University, Flagstaff, Arizona, received his B.A. and M.A. degrees in history and government from the University of Kansas City and his Ph.D. in history from Syracuse University. He has taught history and political science at Syracuse University, the University of Kansas City, the University of Maryland, the University of Arizona, Grand Canyon College, Phoenix, Arizona, and Northern Arizona University.

Dr. Lee has served as a research consultant to the Secretary of the Interior, Administrative Assistant to Congressman John Rhodes, Executive Secretary to former Arizona Governor Paul Fannin, Member of the National Advisory Council on Vocational Education, and is now a member of the National Council on Educational Research. He is a member of numerous professional organizations, and is a past President of the American Vocational Education Research Association.

In 1965 Dr. Lee became the first Research Coordinating Unit director in Arizona, and in 1971 left that position to become Director of Research and Grants at Northern Arizona University. He has published several books dealing with Vocational Education research, and many articles in this field and on historical, political science, and economic subjects. He is listed in Who's Who in the West; Who's Who in American Education; American Men of Science, the Social and Behavioral Sciences; Dictionary of American Scholars; and Contemporary Authors.

Mr. C. O. Tower, Associate Director of Project Baseline during its third year, was educated in Kansas and Ohio. He received his B.S. degree from Kansas State College at Pittsburg in 1927 with a major in mathematics, a Master's degree in school administration from the University of Toledo in 1929, and additional graduate work toward a doctorate in Vocational Education at the University of Cincinnatti.

C. O. Tower's educational experience includes 13 years as a teacher, 34 years as a school administrator, and 13 years as a researcher -- with some overlapping of these activities. He has served in numerous leadership positions in educational and particularly Vocational Education organizations. Mr. Tower has served as a consultant and writer for the U.S. Office of Education, the National Council on Vocational Education, the American Vocational Association, the National Education Association, and various other agencies and organizations. He was Assistant Director of the Ohio State Department of Education in charge of Research, Survey, Evaluation, Exemplary and Program Planning before joining Project Baseline in 1973.

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